FINAL TECHNICAL REPORT / RAPPORT TECHNIQUE FINAL

UNDERSTANDING DIGITAL ACCESS AND USE IN THE GLOBAL SOUTH (108336-001)

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Understanding Digital Access and Use in the Global South

2019 Final Technical Report

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1. Synthesis

It is widely accepted that access to, and use of ICTs is a prerequisite to human development. Without connectivity people, be they citizens, consumers, workers or entrepreneurs, face barriers to participating in the economic and social networks that permeate modern societies.

The UN 2030 agenda acknowledges ICTs as crucial tools for the successful implementation and achievement of sustainable development goals (SDGs). Over the years proliferation of ICT services has allowed most developing countries to participate in the digital economy and increase their overall economic competitiveness. This economic development, however, has been extremely uneven between rural and urban areas and amongst different socio-economic groupings. With increasingly complex broadband technologies overlaid by content platforms and applications, adoption has slowed. Penetration rates in many African countries are way below the critical mass of 20% believed to produce the network effects associated with economic growth.

Digital inequalities prevent people from fully benefiting from the advantages that new technologies bring about, resulting in societal inequalities. But digital inequalities are not only the result of uneven physical access to varying forms of ICTs, they are also a result of what people are able to do online. In the predominantly pre-paid mobile environment of the Global South it is only through demand-side studies of ICT use that critical public policy issues of digital inequality can be identified and measured, and therefore the exact points of policy intervention identified

With these low levels of diffusion the capacity of ICTs to improve delivery of quality goods and services in the areas of health care, education, finance, commerce, governance and agriculture, as has been witnessed in more developed economies, is limited. In a data environment demand-side stimulation is required in addition to supply-side stimulation in order for ICTs to support poverty reduction, boost health, create new jobs, mitigate climate change, improve energy efficiency and make cities and communities sustainable.[1]

The IDRC grant, Understanding Digital Access and Use in the Global South – 108336-001, has been used to support Research ICT Africa's research project in the context of the fast-changing and dynamic global ICT sector, and to re-establish the Household, Individual, and Informal Business ICT access and use surveys, RIA's flagship project which was first established in 2008.

The research has made both theoretical and policy contributions by:

1. developing a comparative set of ICT and socio-economic indicators for 16 countries across three regions of the Global South to assess the impact of ICT policy and market developments on generating or closing social inequalities, particularly with regard to developing a better understanding of gender, youth and urban poor dimensions of inequality; and
2. enabling a better understanding of what the "after access" challenges are, the capabilities required by citizens to exercise their rights to participate in a digital world, the constraints on

[1] https://www.itu.int/web/pp-18/en/backgrounder/6050-icts-to-achieve-the-united-nations-sustainable-development-goals

them to do so, and policy options for government interventions to reduce social inequalities through digital inclusion.

RIA collaborated with LIRNEasia and DIRSI to fund a total of 16 countries (seven in Africa, four in Asia and five in Latin America) with a total IDRC budget of USD 836 960. The study was initially called Beyond Access because we wanted to move beyond the narrow focus on connectivity (connecting the last billion) as the source of digital inequality and draw on the demand-side bottlenecks which had clearly emerged from the modelling of the previous survey. The study was disseminated as After Access to distinguish it from an already existent Beyond Access initiative.

All the surveys covered by this grant were completed in 2017, and in 2018 the project shifted more fully into the dissemination and communication mode. Nevertheless, some payments related to the fieldwork were completed at the end of 2017/beginning of 2018, and those are reported in Annex I: Budget summary. In addition, RIA received co-funding from SIDA to cover two additional countries in Africa, Uganda and Senegal. Together with the ITU-funded national survey in Lesotho which served as our pilot in 2016, the total number of African countries covered by this project managed to scrape back to 10. At the height of the ICT access and use surveys in 2008 there were 20 countries active in the RIA network and surveys were successfully conducted in 17 of those. In 2012, with various contributions at country level, the funding for 10 surveys was extended to 12 countries.

With the overlapping IDRC grant, Catalysing Broadband for Africa, which funded two surveys in Kenya and South Africa, and this AfterAccess survey grant which funded six countries, RIA was able to develop and finalise survey thematic studies – specifically on gender, youth and ICT, urban poor, mobile money, and microwork. The rich dataset allows detailed analysis and modelling, bringing much greater granularity to our understanding of developing markets and society, and thereby to policy and regulatory recommendations. The AfterAccess study was conducted for the first time using the same questionnaire and methodology across 20 countries in Africa, Latin America and Asia. On behalf of the three regions RIA managed a CAD 200 000 budget for global and regional communications that was used to develop an integrated communications strategy which includes a dedicated website.

For the second round of IDRC funding for Beyond Access/AfterAccess, Nigeria (USD 35 000), and South Africa (ZAR 200 000/USD 16 950) committed to contributing to country reports and collaboration on the survey. Regulatory staff in these countries attended the survey training and the executive director spent two weeks in each country working closely with the regulators on gathering supply-side data from operators and consulting with stakeholders. In Lesotho (funded by the ITU), the report which proposed large scale market restructuring to enhance competition in the market, was well received at the validation workshop (other than by the duopoly operators), but with the change of political administration and with the challenged outcome of the snap election in June 2017, the report was delayed until the new administration had settled in. It is now available to the public on the (Lesotho Communications Authority (LCA) website, and has already been a resource for African Development Bank and World Bank studies.

The #AfterAccess data has been presented nationally, regionally, and internationally. It was profiled at the Mobile World Congress Ministerial Track in Barcelona, the World Summit on the Information Society, UNCTAD e-week and IGF in 2017 and 2018. The African data was presented at continental, regional and national events. ITU Telecom 2018 was held in Durban, South Africa, in September 2018 and RIA contributed to several of the high level panels. The data was also

presented at the UNCTAD Africa eCommerce Week and the AU member state training on cybersecurity.

It has been used to support multiple technical assistance projects for the African Development Bank, most recently on Harnessing the Benefits of the 4th Industrial Revolution for Africa. The country reports have been extensively used for complementary research and to support national processes. In South Africa, the State of ICT Report in SA has been used by the Parliament of South Africa for cost of communications, and in consideration of the now scrapped Electronic Communications Amendment Act.

As the project comes to a close, we report on the outputs and outcomes of this grant in the context of RIA's Theory of Change.

2. RIA Theory of Change

In 2013, the IDRC contracted the Developing Evaluation and Communication Capacity in Information Society Research (DECI) team to work with RIA to evaluate a decade of their funding, as well as to assess the impact of their research to policy work. The ultimate aim was to look forward and prepare the ground for future activities.

The main output of that collaboration was a Theory of Change (ToC) for RIA. As a ToC is a process rather than a product, the approach has been updated and revised a number of times: in 2016 to reflect external and internal organisational changes, and again in 2017 with the implementation of the communications and evaluation strategies. In the revised 2017 ToC (Figure 1), communications and evaluation processes are iterative at all levels of the ToC in order to maximise internal and external visibility and therefore cyberpolicy impact. The development of a clear and integrated communications and evaluation strategy following the DECI evaluation has resulted in RIA's inclusion of communications – together with research, capacity building and collaboration/networking – as one of the core strategies in our Theory of Change (ToC), given the contribution that communications makes to achieving our vision and mission in the region.

The communications strategy now focuses on RIA's networks and hubs of influence, as well as on opening pathways for RIA to build strategic relationships with governments, donors, public policy experts, and other key partners.

To ensure efficient communication, an internal and external strategy has been developed.

- Internally, the purpose of the strategy has been to build capacity for all researchers to develop communications strategies at a project level, aligned with the overall RIA process. A communications workshop was conducted with the RIA team on developing communications strategies aligned with RIA's overall purpose – and these were followed up with individual meetings with project leaders to assist in developing project strategies.
- The external communications strategy is being developed to align with and promote the key purposes of RIA. Identification of various audiences has been followed by matching organisational objectives to audience and purpose.

Methods of communication mainly comprise the RIA website, social media platforms, mailing list development, reliance on networks, attending face-to-face meetings, and write-ups such as policy briefs, blogs and reports. We also use the RAPID response approach by packaging relevant research in an easily accessible way to maximise windows of opportunity.

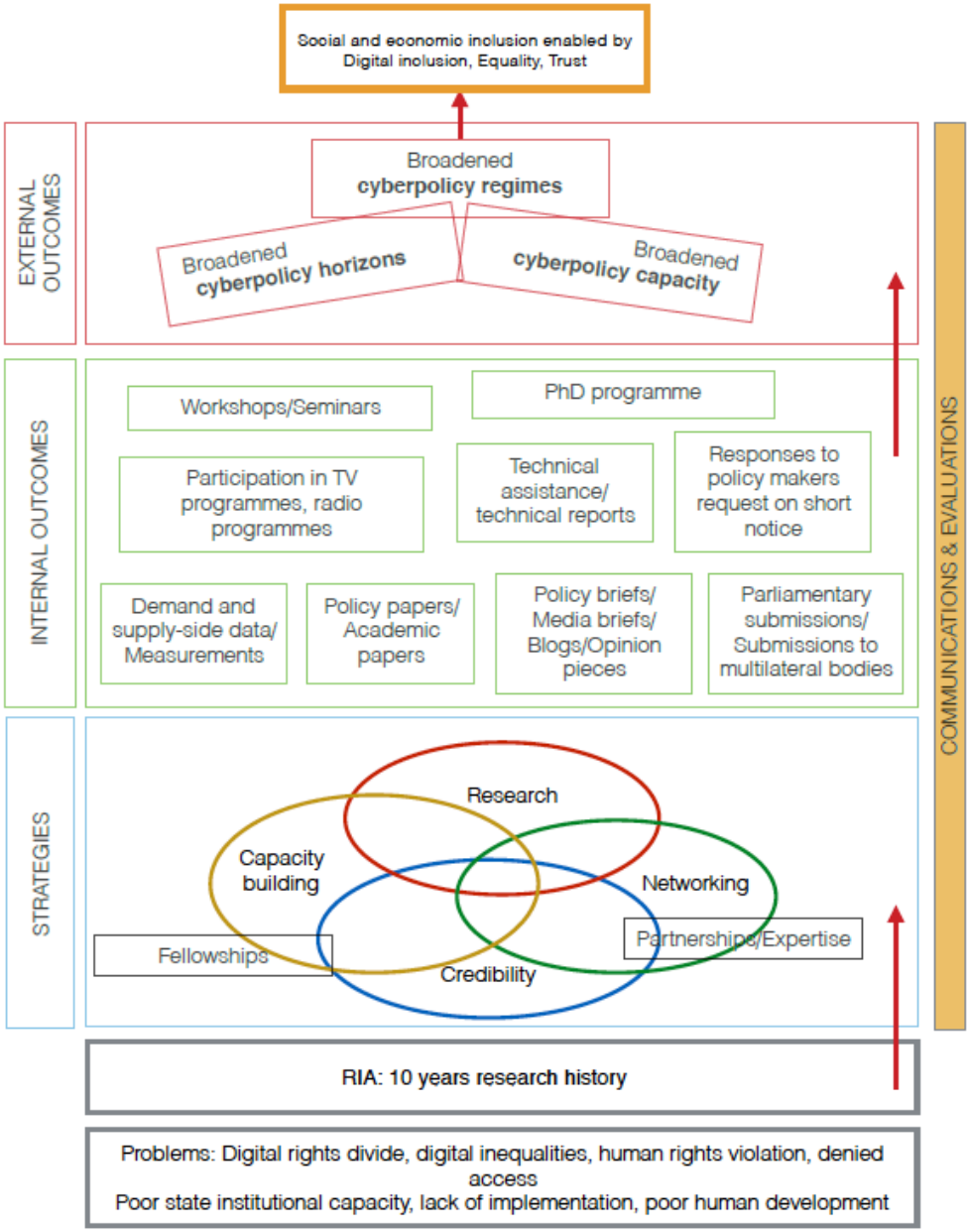

Figure 1: RIA's Theory of Change diagram

3. Problem statement and project objectives

This research project is driven by the growing importance of Information and Communication Technologies (ICTs) for human development, but also the growing digital inequality as more advanced technologies became available to the elite and the potential harms and risk associated with the intensification of 'digitisation' and 'datafication'. The World Development Report 2016 acknowledges that while in many instances, digital technologies have boosted growth, expanded opportunities, and improved service delivery, their aggregate impact has fallen short and is unevenly distributed.

To get the most out of the digital revolution, countries also need to work on the "analog complements"—by strengthening regulations that ensure competition among businesses, by adapting workers' skills to the demands of the new economy, and by ensuring that institutions are

capacitated and accountable. The Sustainable Development Goals (SDG) also include ICT access and use into the purview of the new targets. Yet, our understanding of factors influencing digital inclusion and exclusion – in particular those 'beyond access' remains limited.

The challenge is particularly pressing in the Global South which is undergoing rapid social and economic change as a result of the confluence of mobile and broadband technologies. There is mounting evidence that broadband directly contributes to job creation and stimulates economic growth. The improvements in the flows of information and the reduction in transaction costs not only improves the efficiency of business but enhances the well-being of those who are connected to the Internet. But there is also evidence of an increasing divide, not only between those with access to such services and those without access, but between those who are connected with the means and skills to utilise the Internet optimally and those who are not. From a policy perspective this requires extending interventions to address inequality from those focussed purely on supply-side investment and operator-based strategies to those focussing on demand-side challenges, still of affordability but also a range of other enabling or enhancing digital inclusion factors, such as education, income, gender, e-skills of various kinds at various levels, content and language, and rights to privacy, safety, security and freedom of expression online.

Human capability factors determine digital inequality outside of the traditional communications sector. These factors, combined with public-private interplay in the supply of ICT and the crosscutting nature of ICT in the economy and society, imply that integrated and coordinated policy responses are required from the State. While access to affordable bandwidth will remain a key objective of any policy and a necessary condition for realising the benefits of broadband Internet, affordable physical access to ICT is by no means a sufficient condition for these benefits.

4. Implementation

4.1 Household, Individual and Business ICT Access and Use Surveys

The overall objective of this project is to catalyse evidence-based policy change that enables people to improve their lives through the use of information and knowledge that is shared and accessed via ICTs. It does so by enhancing the decision-making process related to development – specifically the development problems that can be solved (or partially solved) by knowledge, information and technology. In order to achieve this objective the project approaches these issues from a beyond-access perspective – one that does not look exclusively at the question of physical access to ICTs. Rather, the primary purpose of this research project is to better understand the new AfterAccess challenges and to build an evidence base for demand-side intervention through survey data collection, indicator development, and analysis.

4.2 Implementation and challenges

As the co-funding for the Nigerian, Kenyan and South Africa surveys was not forthcoming from their Governments as previously agreed, in 2015 IDRC approved the consolidation of funds to cover the cost of undertaking the survey in two countries to ensure that at least some countries from the original longitudinal data set were covered. As Nigeria was the most expensive to survey, it was dropped. As these country surveys had been delayed so long and RIA was awarded additional funding for another five countries under the Understanding Digital Access and Use in the Global

South grant from IDRC, the two initial surveys were held over for comparative purposes and all surveys were undertaken in 2017.

With the Executive Director having restored relationships with country partners following the interregnum between surveys, the research manager at that time, Dr Enrico Calandro, took over a significant part of the country coordination and complex field work logistics with local partners, together with our econometrician, Dr Onkokame Mothobi, who worked with our fieldwork supervisor from Sierra Leone, Mariama Deen-Swarry. With agreement from SIDA to support the survey on the proviso that it extended beyond Africa but still focused on it, our regional partners LIRNEasia and DIRSI were brought on board. This enabled the same questionnaire and methodology to be applied across the three regions for the first time. Building on previous questionnaires, a new questionnaire was collectively developed to focus on the "After Access" dimensions of the report. – the global study subsequently being renamed the After Access Survey. Senior researcher, Dr Mothobi Onkokame, took the academic lead on the project as well as responsibility for the coding of questionnaires onto the electronic devices, curating the data, and the development of indicators. RIA also collaborated with DIRSI and LIRNEasia on the sharing of databases, and development of indicators arising from the shared survey instrument as part of the global communications strategy for the Beyond Access/After Access project.

In order to complement the ICT expertise within the organisation, RIA has also drawn in subject specialists on various projects currently running. Dr Christoph Stork was the technical advisor for Kenya, Mozambique, Tanzania, and South Africa; and Mariama Deen-Swarray, who previously managed the surveys as a RIA staff member, provided training and support for the piloting of surveys in Lesotho, Senegal, Nigeria, Rwanda, and Ghana. In each country, a RIA country partner has provided logistical support and liaised with the national bureau of statistics and regulatory agencies for the necessary enforcement to conduct the surveys and obtain the sample based on the census. The surveys were all conducted electronically except where it was unsafe for people to enter areas with smart devices.

In addition, RIA employed the services of iKapa, a survey company based in Cape Town who, with state-of-the-art technological backend to their survey instruments, assisted with technical development of the questionnaire, coding of the devices and quality control. They undertook the South African survey and provided backend support to the Ugandan and Mozambican survey teams that encountered problems with implementation and data capturing.

4.3 Analysis and reporting

In 2018, RIA worked on cleaning all datasets (i.e. household, individual and information sector data) across all countries covered by the survey, which allowed development and finalisation of survey thematic studies – specifically on gender, youth and ICT, urban poor, mobile money, and microwork. Nationally representative surveys facilitate the disaggregation of data so that it can be modelled in these areas. Through modelling and analysis, factors of exclusion/inclusion from the digital economy and society are identified as well as specific points for policy intervention.

Drawing on the survey findings and the pricing and quality of services findings (funded under the previous grant), country case studies, policy papers and policy briefs have been developed to tap into windows of opportunities. The comparative analysis within Africa and as part of the wider After

Access comparative studies between the regions, has been produced a number of thematic areas – including gender, youth, urban poor, microwork and digital finance.

In addition, RIA made a submission to the public hearing set up by the Department of Telecommunications and Postal Services in South Africa on the changes proposed in the Electronic Communications Act Amendment Bill, drawing extensively on previous IDRC-funded research, particularly that on open access in relation to the controversial exclusive open access wireless network being proposed (https://researchictafrica.net/2018/02/06/submission-on-eca/). RIA's submission has received extensive coverage and was used (formally and informally) in other presentations[2]. The Executive Director engaged with the Director General of the Department of Telecommunications on the merits of the case in Business Day, and was also interviewed by Classic FM on the same issue.

The data was also used in another presentation done as 'Friends of the Parliamentary Committee on Telecommunications and Postal Services' to introduce public hearings on the Cost of Communication.

As the funding for the thematic areas was covered by the previous programme budget it is not reported on here, but the arising policy papers covering all the countries are part of both the previous grant as well as this project.

5. Communications strategy

5.1 Global strategy

The After-Access research data presents an opportunity to shape policy conversations in the global south. RIA, DIRSI and LIRNEasia commissioned the South African-based company, Atmosphere, to develop and implement a communications strategy. The communication goals have been to:

- increase the awareness of the After Access findings among key target audiences by highlighting the importance of the research;
- improve the target audiences' knowledge of the specific challenges in the Global South by making the research accessible to all, and easy to engage with; and
- position Global South research to influence policy making decisions and identify the need for further research by presenting research results to the right audience.

The desired outcome of this strategy is to accelerate changes in policies through communication, and to enable populations in Asia, Africa and Latin America to improve their lives through the use of information and knowledge generated across ICTs.

2 See, for instance, Techcentral (article-https://techcentral.co.za/telecoms-bill-must-withdrawn-research-firm/79469/), and ITweb (https://www.itweb.co.za/content/KBpdg7pPkYJ7LEew/R8OKdWMDnJvbznQL and https://www.itweb.co.za/content/WnpNgM2AxbY7VrGd/oJKjlyr7wO7k6amV).

The intention is to communicate the relevance and the insights of the research, to build a credible presence in the research community and, specifically, to define audiences in order to profile After Access as the definitive source for Global South ICT research.

The key messages developed are:

- the rigour of the data – it provides good quality comparative data across the three regions;
- access and usage – the research moves beyond a focus on access and connectivity to understanding how the internet is used; and
- the importance of context – the research provides insight on the various challenges facing the Global South and that 'a best fit' policy approach is relevant for the developing world.

The communication channels for the project are the AfterAccess twitter page, use of network partners' websites and a micro-site afteraccess.net. Thematic areas for collaboration have been identified and these are connectivity, gender, microwork and the digital future. These will be presented as infographics, policy papers, presentations housed on the micro-site, opinion pieces on relevant sites, and public engagement at international meetings.

The strategy was developed collaboratively with all partners in January 2018 and implemented throughout the year. Figure 2, below, illustrates the agreed approach. The success of this collaboration is highlighted by the #AfterAccess team winning the EQUALS in TECH Award – Research Category. Together with Chenai Chair, the Executive Director went on to prepare a gender policy paper for the EQUALS event that utilised the data across all three regions. She also edited a chapter of the three regions' collective input for the book, Equals in Tech.

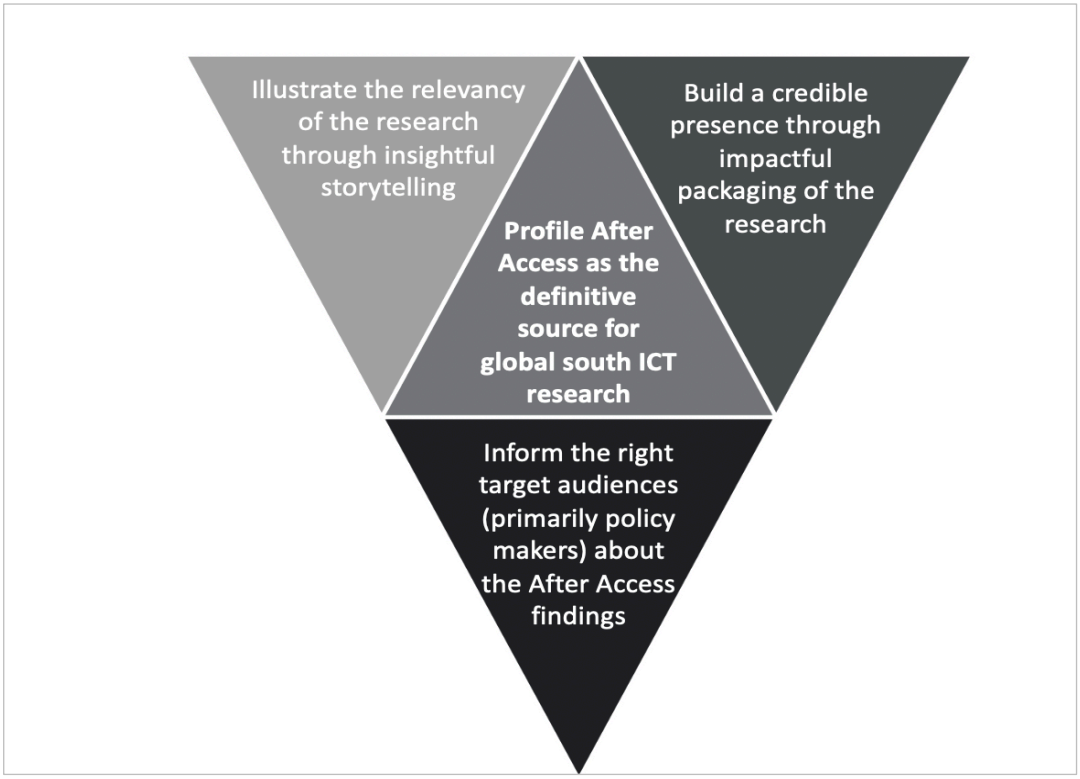

Figure 2: Summary of Global Communications Strategy

5.1.1. After Access micro-site

South African communications company, Atmosphere, was commissioned to work on the global communications strategy with the three AfterAccess teams and to develop a website to house the research. The website provides an overview of the network's research and is a repository for the different research outputs, including reports, infographics and a media centre. The content was developed collaboratively with the team, and this will be the main site to share global and regional activities with the wider public.

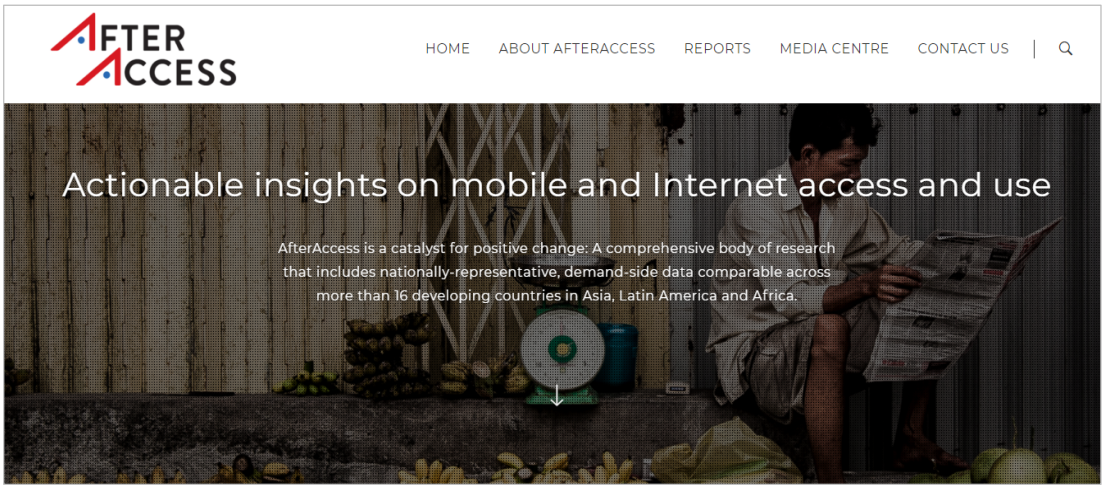

Figure 3: Home page of After Access website

5.2 Regional strategy

The three regions developed individual strategies which were in line with the objectives of the global strategy but contextualised to each of their regions. #OlaTICs – Oportunidades luego del acceso a las TIC (Opportunities after ICT access) is the name given to the After Access Project in Latin America. Their online engagement included a micro-site and social media pages under #olatics. #OlaTICs developed four communications and incidence activities, two of them in Peru and the others in Ecuador and Paraguay.

For each country in the Asia region LIRNEasia identified key findings as well as key stakeholders who could impact policy change in the relevant areas. Stakeholders were approached for a discussion on the issues presented by the findings. In the interests of promoting a rounded conversation, LINREasia included stakeholders from government, private sector, civil society and media. The discussion in each country within the Asia region was centered on a launch event for the "AfterAccess: ICT access and use in Asia and the Global South" report.

Research ICT Africa focused on dissemination of the findings which included the publication of policy briefs, policy papers, and thematic areas on youth and microwork (all publications are listed below). Op eds on the After Access data were written by RIA's Executive Director and featured on The Conversation and The World Economic Forum Blog. The global findings were also used by the Executive Director, representing civil society and academia in the opening high-level panel of WSIS, from where it drew extensive coverage in the ITU News and conference broadcast. The data was also used by LIRNEasia and RIA for the UNCTAD e-week and extensively for the UNCTAD e-Africa week in Kenya in 2018.

6. Public engagement and communication implementation

Research ICT Africa participated on a number of panels at the IGF and convened the alternative policy and regulatory access and use panel with the African Union. The Executive Director was on four panels at IGF 2017, and also convened a panel with DIRSI and LIRNEasia specifically on AfterAccess data, comparing high level indicators across the three regions. #AfterAccess data was referenced on a number of other panels at IGF 2017.

6.1 Policy briefs

1. SADC not bridging digital divide, 2017. Available at: https://www.researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017_Policy_Brief_6_SADC.pdf

Research ICT Africa's 2017 After Access findings show that the digital divide exists among SADC countries, Lesotho, South Africa and Tanzania. Internet use is high in South Africa (53%) followed by Lesotho (32%), while Internet use in Tanzania remains below the 20% required to produce the network effects associated with economic growth.

The survey findings show that slightly more men (36%) than women (31%) use the Internet in Lesotho and Tanzania (28% of women compared to 31% of men). The Internet gap is even larger in rural than in urban areas. With operators targeting urban markets and universal service funds being ineffectual in several countries, except in Lesotho, about 83% of rural dwellers remain unconnected to the Internet, while about half of urban areas are not connected in Lesotho. In Tanzania, 86% of rural dwellers remain unconnected to the Internet compared to 45% in urban areas.

2. Cost of smartphones continue the digital divide in Tanzania, 2017. Available at: https://www.researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017%20Policy%20Brief%204_Tanzania%20.pdf

The Tanzanian mobile market has been one of the most vibrant markets on the continent as a result of higher competition and an enabling wholesale cost environment. Consumers have been the beneficiaries of fierce pricing strategies, yet this dynamism has now been stultified by operators' continued efforts to extract revenues from traditional services where prices remain relatively high. RIA's nationally representative ICT Access and Use Survey shows that mobile phone subscribers are spending a large portion of their communication budget on traditional voice/SMS services. Only 20% of their communication budget is spent on data despite evidence that data products provide cheaper alternatives to traditional communication services. The Survey shows that even though data prices are relatively low, they remain unaffordable to most people, and the high cost of Internet-enabled devices compounds the problem. About 70.2% of Tanzanians do not have access to the Internet, with more than half of non-Internet users reporting that smartphone devices are unaffordable.

3. Disentangling the broadband divide in Rwanda: Supply-side vs demand-side, 2017 & 2018. Available at: https://researchictafrica.net/polbrf/Research_ICT_Africa_Policy_Briefs/2017%20Policy%20Brief%202_Rwanda.pdf

Rwanda has made significant investments in telecommunications infrastructure over the past years. In 2018, the country reportedly achieved a 95% 4G/LTE coverage. An investment which was

facilitated by the 2013 partnership between the Government of Rwanda and Korean Telecom (KT), a firm in charge of providing 4G/LTE wholesale services in Rwanda. Results from the After Access survey show that demand-side factors such as lack of Internet-enabled devices are significant inhibitors of Internet use in Rwanda and other African countries. RIA's nationally representative household, individual and business survey shows that only 9% of Rwandan citizens, 15 years and above, use the Internet. The survey findings suggest that lack of devices used to access the Internet is the main reason behind low Internet penetration in Rwanda. Less than half (48%) of Rwandans own a mobile phone while 4% of Rwandans own a smartphone. On the other hand, despite low prices, a significant proportion (33%) of Rwandans still cannot afford the Internet. This is evidence that reductions in prices through improved competition and improvements in telecommunication infrastructure is not enough to deal with demand-side issues such as affordability and access.

4. Lagging ICT adoption in SA reflects social and economic inequalities, 2018. Available at: https://researchictafrica.net/research/research-policy-briefs/

Research ICT Africa's After Access Survey shows that first-level digital exclusion still exists in South Africa with about half of the adult population not using the Internet. Digital inequalities continue to be combined with race, income, gender and other offline axes of inequalities. In the case of South Africa, a society with pronounced income and educational inequalities, the Survey shows that despite the hype around smartphones connecting the poor, the digital divide between the poor and the rich remains significant. The Survey finds that 50% of the population is not connected and most of those people fall into the lower income groups.

Affordability of devices and services are the main barriers for South Africans intending to use the Internet. 36% of those who are not using the Internet declared that they do not have devices needed to get online, and 15% stated that the Internet is too expensive. The results from the RIA After Access Survey show that digital literacy and income are the main barriers for Internet use.

5. Dynamic mobile market stunted by demand-side constraints, 2018, Mozambique (forthcoming) https://researchictafrica.net/2019_demand-side-constraints_mozambique/

Despite the shake-up of the market and a series of positive outcomes, RIA's AfterAccess Survey in Mozambique finds that the country is still at an early stage of adoption. Six out of ten Mozambicans, 15 years and above, do not have a mobile phone. Internet penetration is even lower, with only 10% of the population using the Internet. Mozambique was compared with other countries in the region and the Global South. Mobile phone and Internet penetration is found to be aligned with GNI per Capita. Rich countries are found to have relatively high Internet use and mobile phone penetration, with the least developed African countries in the survey having low Internet use and mobile phone penetration. Mozambique has the lowest Internet use, only higher than Rwanda (9%) among the surveyed countries. Of all the surveyed countries, Mozambique has the lowest mobile phone penetration and the second highest gender disparity in Internet use at 36%, after Rwanda's 38%. The disparities are even larger among Internet users at 50%, and exceeded only by Rwanda (62%). Affordability of Internet-enabled devices and e-literacy are the main barriers to Internet access in Mozambique. Of those offline, eight in ten stated that they do not have devices to access the Internet while 14% are digitally illiterate. Access to financial services is limited in Mozambique. The survey findings suggest that nine in ten Mozambicans, 15 years and above, do not have access to a bank account.

6.2 Brochures

1. After Access: The inside internet story of Africa, Asia and Latin America : Mobile and internet use in the global south has no 'one-size-fits-all' approach. (2018). https://afteraccess.net/wp-content/uploads/After-Access-Website-layout-r1.pdf
2. After Access: Digital commerce -the good, the bad and the opportunity (https://afteraccess.net/wp-content/uploads/2018_After-Access_Microwork.pdf)
3. African digital platforms and the future of financial services, 2018 Research ICT Africa in collaboration with insight2impact, Cenfri https://cenfri.org/publications/african-digital-platforms-and-the-future-of-digital-financial-services/

The research maps digital platforms supply-side data collected by Cenfri, i2i to the demand-side After Access Survey. Cenfri, i2i collected information on African digital platforms providing a virtual infrastructure matching work suppliers with workers in Ghana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda and Zambia. This data was mapped with RIA's demand-side from seven African countries, which mapped with the aforementioned countries except for Zambia. The research finds that about 4.8 million African people work on digital platforms, representing about 2% of these countries' populations. The survey findings suggest that there exists a gender gap among digital workers in favour of males (54%) as compared to females (46%). However, these platforms are the primary source of income for the majority of females (68%) compared to males (45%). A significant proportion of digital platform workers use the Internet (87%) while about eight in ten have access to a bank account.

6.3 Policy papers

1. Onkokame, M., Schoentgen, A., and Gillwald, A. (2017). What is the state of microwork in Africa? Policy Paper Series No. 5 After Access: Paper No. 2 (2017). Available at: https://researchictafrica.net/wp/wp-content/uploads/2018/10/After-Access_The-state-of-microwork-in-Africa.pdf

The objective of this paper is to understand the participation of African workers on the online work or microwork platforms. Microwork entails dividing up a large job into many small manageable pieces of work and allocating them to a large number of workers using an Internet-based platform (Kobayashi et al. 2014). Microwork is characterised by online forum participation, data input and image tagging, which are usually performed quickly and require no specialised skills. Workers are usually paid small amounts of money for each task. High adoption of Internet-enabled devices has led to some platform developers focusing on micro-tasks that can be performed on mobile phones (Murugesan 2013).

2. Gillwald, A (Ed) (2018) Understanding the Gender Gap in the Global South, After Access, DIRSI, LIRNEasia, Research ICT Africa. Available at: http://afteraccess.net/wp-content/uploads/2018-After-Access-Understanding-the-gender-gap-in-the-Global-South.pdf

This research aims to address the data challenges involved in understanding gendered digital inequality through quantitative and qualitative analysis of not only ICT access and use in 17 countries across the Global South, but also the barriers to coming online and the limitations on optimal use. The nationally representative After Access 2017 Household and Individual Survey was conducted using the national census as its sample frame. Households were sampled using simple random

sampling and the head of the household was interviewed to obtain household indicators. An individual, 15 years or older was then randomly selected from each household and interviewed about their mobile access and usage. The findings of the ICT access and use survey undertaken by DIRSI, LIRNEasia and RIA across 17 countries in the Global South during 2017 highlights the significant demand-side challenges to achieving SDGs in ICT including affordability of devices and services, low education and associated income levels, digital literacy, and limited availability of relevant local content. Through the modelling of data it identifies the factors behind digital inequality that are often masked by aggregated descriptive indicators, revealing the real point of policy intervention to address gender inequality.

3. Chair C and De Lannoy, A (2018) Youth, Deprivation and the Internet in Africa, Available at:https://researchictafrica.net/after-access-survey-papers/2018/After_Access:_youth_and_digital_inequality_in_Africa.pdf

The Internet is presented as a panacea for the challenges that young people face, but this is not necessarily the case. Despite being drivers of Internet take up, young people's use of the Internet is not optimal, especially within contexts of deprivation. The arising policy question this research seeks to answer is: what are the best approaches to ensuring that Internet access and use benefits youth within a context of poverty. The study investigates, from young people's perspectives, whether the Internet could be used to help them deal with the various issues they face. With a focus on Nigeria, Rwanda and Tanzania, the paper considers what the policy implications of this are and proposes possible policy interventions.

4. Ndung'u, M.N., Lewis, C. and Onkokame, (2019) The state of ICT in Kenya. Available at: https://researchictafrica.net/wp/wp-content/uploads/2019/06/After-Access_The-state-of-ICT-in-Kenya.pdf

This report looks at the information and communication technology (ICT) sector in Kenya from both supply-side and demand-side perspectives, highlighting the dramatic changes that have taken place in this dynamic sector since the last sector performance review of Kenya was done by Research ICT Africa only five years ago (Waema & Ndung'u, 2012). The importance of understanding what happens 'after access' is revealed through the fieldwork survey undertaken in 2017, which covered 1 200 households across the country as well as 500 small and micro businesses. This is complemented by a supply-side analysis of policy outcomes in the country, primarily in relation to affordable access, and Kenya's readiness for what is now popularly referred to as the Fourth Industrial Revolution.

5. Gillwald A and Mothobi O (2019) After Access 2018: a demand-side view of mobile internet from 10 african countries, Available at: https://researchictafrica.net/wp/wp-content/uploads/2019/05/2019_After-Access_Africa-Comparative-report.pdf

ICTs and particularly broadband technologies, have been identified as critical drivers of social and economic growth and development. Smartphones, in particular, have revolutionised the telecommunications industry by becoming the principal means of Internet connectivity. After years of sluggish uptake of the Internet with the high cost of fixed broadband services, requiring expensive computer connectivity and relatively high digital literacy, the initial rapid mobile Internet adoption appears to have flattened out in many countries. In addition, a number of these countries are below the 20% critical mass believed to be necessary to enjoy the network effects associated with improved efficiencies and enhanced information flows for economic growth and innovation.

Research ICT Africa's 2018 After Access ICT Access and Use Survey shows that several of the African countries surveyed between 2017 and 2018 are below 15%, with Rwanda and Mozambique at around 10%. The survey results show that, without complementary policies, new digital technologies and Internet-based services simply amplify existing inequalities.

6. Gillwald A, Mothobi, O and Rademan R (2018) The State of ICT in South Africa. Available at: https://researchictafrica.net/wp/wp-content/uploads/2018/10/after-access-south-africa-state-of-ict-2017-south-africa-report_04.pdf

In contrast to the era of expensive fixed-telecommunication devices, such as desktop computers and fixed-line technologies, the majority of Africans are increasingly connected to the world digital information via smartphone and other mobile devices. The vast majority of Africans now own a mobile phone of some kind. The 2017 After Access Survey shows that about seven in ten (68%) of residents of the surveyed countries own a mobile phone, with 21 percent smartphone penetration. Internet penetration is found to be aligned with GNI per capita, a pattern which is broadly true for the gender gap and urban-rural divides. Though GNI per capita masks extreme inequalities in South Africa, the country performs well in relation to gender equity. The survey finds that South Africa has the highest mobile phone (84%) and Internet use (54%) among the surveyed African countries. Internet use in South Africa is also higher than in Ghana (28%) and Nigeria (27%), which are some of the largest markets in Africa.

7. Gillwald A, Odufuwa F and Mothobi, O (2018) State of ICT in Nigeria, 2018. Available at: https://researchictafrica.net/wp/wp-content/uploads/2018/10/After-Access-Nigeria-State-of-ICT-2017.pdf

In prepaid markets where the majority of subscribers own more than one SIM card, it is only through nationally-representative surveys that accurate and disaggregated data can be collected. Nationally-representative demand-side surveys are the only means by which reliable estimates on gender, urban-rural divides and income groups can be drawn. In 2017, Research ICT Africa conducted the After Access Survey as part of a 20-country Global South survey in Nigeria and six other African countries. The survey in Nigeria demonstrates that a significant proportion of Nigerians (71%) do not use the Internet, while 36 percent do not have mobile phones. The lack of a flexible regulatory model for mobile money has stunted its growth in Nigeria, with the country's population being amongst the lowest mobile money users of eight African countries surveyed in 2017. Even in the absence of anti-competitive practices, this creates a situation where smaller operators cannot compete against dominant operators without cost-based access to the dominant operators' networks.

8. Gillwald A, Deen Swarry, M and Mothobi, O (2017) State of ICT in Lesotho Available at: https://researchictafrica.net/wp/wp-content/uploads/2018/01/2017_The-State-of-ICT-in-Lesotho_RIA_LCA.pdf

More than half of all households (52%) were headed by women. This is not surprising considering the high numbers of migrant workers in the population, many of whom work in South Africa or in the country's capital, Maseru. One of the contributing factors to the low level of ICT use in Lesotho is that half of the households in the country have no access to electricity. Among the 47% of households that have access to some form of electrical supply, 34.5% are connected to the main electricity grid, 11.3% use solar and the remaining 1% use a generator or are connected through a neighbour. In terms of household ICT assets, only 1.9% of households indicated that they have a

fixed-line telephone, while 16.6% stated that they have a mobile phone. Radio is still common among households, with 52.8% of households indicating that they have a radio.

9. Gillwald A, Mothobi O and Rademan B (2019) State of ICT in Mozambique, 2018. Available at: https://researchictafrica.net/2019_after-access_the-state-of-ict-in-mozambique/

Mozambique recorded the highest gender disparity (41%) in the adoption of mobile phones among surveyed countries. The disparities are more pronounced among Internet users, at 50 percent. The urban-rural gap is even more pronounced (85%), with 24 percent of the urban population 15 years and older using the Internet, while only a few (4%) in rural areas use the Internet. The low levels of Internet use in the country is attributed to issues relating to affordability, education and lack of electricity in rural areas. More than two-thirds of those who do not use the Internet stated that they do not have Internet-enabled devices, while more than a third stated that they do not have mobile phones due to lack of electricity.

10. Adam, L., Gillwald, A., (2019). Risks and Opportunities of late Telco Privatisation . Available at https://researchictafrica.net/2019/02/15/privatization-of-the-telecom-sector-in-ethiopia/

The announcement of the privatisation of Ethio Telecom has generated much interest and has improved the prospects of a competitive ICT sector in Ethiopia. This paper discusses some of the critical steps that the government of the Federal Democratic Republic of Ethiopia needs to consider during the privatisation of the fixed, mobile, Internet and data monopoly operator, Ethio Telecom. The privatisation process will not only address the debt burden of the state-owned enterprise, but will also create a dynamic ICT ecosystem, which in turn will create more jobs and innovation. Privatisation alone is not sufficient to bring about improvements in the telecommunications sector. Experiences from around the world show that a series of activities need to accompany the announcement to privatise the incumbent operator.

11. Gillwald, A., Mothobi, O., (2019). "A Demand-side View of Mobile Internet From 10 African Countries" Policy Paper Series No. 5 After Access: Paper No. 7 https://researchictafrica.net/2019_after-access_africa-comparative-report/

While the liberalisation of markets and the introduction of mobile technology has revolutionised the lives of people in the Global South, enabling millions of people to communicate by phone for the first time and to be financially included through mobile money – dramatically modernising economies and societies – it has also been **highly uneven.** As we move from simple voice to higher value Internet services this inequity is compounded. By 2018, in many African countries the number of Internet users had not even met the roughly 20% Internet penetration believed to be the **critical mass** required to enjoy the **network effects** associated with economic growth and development.

12. Gillwald, A., Mothobi, O., Ndiwalana, A., Tusubira, T., (2019). "The State of ICT in Uganda" Policy Paper Series No. 5 After Access: Paper No. 8 https://researchictafrica.net/wp/wp-content/uploads/2019/05/2019_After-Access-The-State-of-ICT-in-Uganda.pdf

In line with global commitments to improve digital inclusion and to realise the Sustainable Development Goals for 2030, the Government of Uganda has committed the country to developing a Digital Vision for Uganda. It aims to build a digitally-enabled society that is "… secure, sustainable, innovative, transformative … to create a positive social and economic impact through technology-based empowerment".

The Vision aspires to deliver a variety of government and private services electronically in various fields – education, health, agriculture, social security, banking, justice and communication. The current draft, however, is constrained by the fact that Uganda has one of the lowest (14%) Internet penetration rates of the 10 African countries surveyed by Research ICT Africa (RIA) as part of the Global South After Access Survey conducted between 2017 and 2018. Only Mozambique (10%) and Rwanda (9%) have lower penetration rates. The other countries in the Survey – Ghana, Kenya, Lesotho, Nigeria, Senegal, South Africa, and even Tanzania, another least-developed country – have higher Internet penetration rates. Internet penetration is not the only area in which Uganda lags behind. Less than half of the population owns a mobile phone, whereas the market is close to mobile phone saturation in countries such as South Africa (83%) and Kenya (87%).

13. Lewis C., Mothobi, O., and Nyambura Ndung'u, M., (2019). The State of ICT in Kenya. Policy Paper Series No. 5 After Access: Paper No. 9. https://researchictafrica.net/2019/07/08/after-access-the-state-of-ict-in-kenya/

Kenya seeks to position itself in the future of this digital world and global economy, spearheading innovation in the area of mobile money. With more than half of the Kenyan population now banked, the benefits are spreading to low-income households and individuals who are still largely unbanked. The digital economy and e-commerce are likely to take centre stage in the next few years. Kenya will need to position itself more aggressively in terms of strategies and policy direction to ensure that it fully reaps the benefits and opportunities presented, and to safeguard its citizens from the associated risks and potential harms.

7. Conclusions and arising research agenda

Research ICT Africa's 2018 After Access ICT Access and Use Survey shows that after years of sluggish uptake of the Internet with the high cost of fixed broadband services, requiring expensive computer connectivity and relatively high digital literacy, the initial rapid mobile Internet adoption made possible by smart phones appears to have flattened out in many countries. This before many countries have reached the 20% critical mass believed to be necessary to enjoy the network effects associated with improved efficiencies and enhanced information flows for economic growth and innovation. The survey conducted between 2017 and 2018 shows that several of the African countries surveyed are below 15%, with Rwanda and Mozambique at around 10%.

The survey results show that, without complementary policies, new digital technologies and Internet-based services simply amplify existing inequalities. Of all 10 African countries surveyed, only in South Africa is more than half the population online. Internet penetration rates in Ghana, Kenya, Lesotho, Nigeria and Senegal are above the 20% threshold, but even this requires further investigation in a developing country context where the unaffordability of data means that usage is generally very low and most people are using services passively – not in the high-speed, always-on environment where studies of causality in relation to penetration and economic growth have been done.

In some countries the low Internet uptake is a result of poor coverage. There is insufficient broadband extension beyond the major urban centres in the cases of Mozambique, Nigeria and Uganda. Yet even in countries where there is extensive coverage, such as in Lesotho, Rwanda and South Africa, the cost of devices is a major barrier to uptake. Such demand-side constraints relate not only to affordability of devices and services, but also to issues of human development. In several

countries, including Nigeria and Tanzania, lack of awareness or skills on how to use the Internet accounts for large numbers of people who remain offline.

Until these demand-side issues are addressed and there is a critical mass of people online who are able to use the Internet intensively enough for the multipliers to be felt throughout the economy, expectations of the Internet contributing directly and indirectly to economic growth and job creation will not be realised.

The relationship between Internet penetration and gross national income per capita can be seen in the broader After Access Survey undertaken across 22 Global South countries. With a GNI per capita of USD 11 923, South Africa aligns with other middle-income countries in Latin America, but its Internet penetration is significantly lower than that of Argentina, Colombia, Paraguay, Ecuador and Peru. Nigeria's GNI per capita income of USD 5 326 and Internet penetration of 29% sits alongside some of the more populous Asian countries with similar GNIs per capita, such as Bangladesh (GNI per capita of USD 3 677 and Internet penetration level of 13%), or Pakistan (GNI per capita of USD 5 311 and an Internet penetration level of 17%).

The least developed countries, namely Rwanda (GNI per capita of USD 1 820), Tanzania (GNI per capita of USD 2 557) and Mozambique (GNI per capita USD 1 093), have the lowest Internet penetration rates. Interestingly, despite having the lowest GNI per capita (USD 1 093), Mozambique does not have the lowest Internet penetration rate, which at 10% is slightly higher than that of Rwanda. Senegal and Lesotho, with GNIs per capita of USD 2 620 and USD 3 510, and Internet penetration rates of 30% and 31%, respectively, are among some of the poorer countries that perform better than larger economies, such as Nigeria and Ghana.

Mobile phone ownership and the gender gap

Mobile ownership also tracks GNI per capita, with the least developed countries only meeting the halfway mark in terms of mobile phone ownership, while the Kenyan (87%) and South African (83%) markets are close to saturation. Mobile phone ownership is between 40% and 87% amongst all the African countries surveyed. GNI also traces mobile phone ownership and Internet access by gender, with the gap between men and women diminishing as more people are connected. In South Africa the gender gap in mobile ownership is negative, with more women than men owning mobile phones. South Africa also has the smallest Internet access gap, with men having 12% on women. Again, the least developed countries have the biggest gender gaps with a 60% gap in Rwanda being the highest Internet access gap between sexes, almost twice as much as the next highest country, Mozambique (37%).

These figures are more in the range of the extreme access gaps witnessed between sexes in Bangladesh (34%), Pakistan (37%) and India (37%). Generally, the urban–rural gap is even higher than the gender gap. Although it is the lowest of the African countries surveyed, at 34% South Africa's urban–rural gap is triple that of its gender gap. The urban–rural gap jumps to between 70 and 80% among least-developed countries with high gender gaps of 50 to 60%. This is particularly stark for Tanzania, with its relatively low gender gap of 32% for a least-developed country, which then more than doubles to 84% in relation to location. Yet, Nepal and Cambodia which have similarly low GNIs per capita, have considerably lower urban–rural gaps at 30–40%.

Household access and use

South Africa, at 11%, has the highest household Internet access, far above the surveyed country average of 5%. This is followed by Kenya (10%) and Ghana (6%). Mozambique (1%), Tanzania (1%) and Uganda (2%) have the lowest levels of household Internet use.

Despite having the highest percentage of households with tertiary level education (31%), Nigeria only has an Internet household penetration rate of 3%. South Africa's percentage of households with tertiary level education is 27% (52% Internet penetration), while the percentage in Kenya is 20%. The barriers to household online connectivity include coverage, lack of Internet-enabled devices, the cost of the Internet connection and services, and digital illiteracy.

Barriers to internet use among individuals

The majority of individuals who use the Internet access it though smartphone devices. Seven out of ten Internet users access the Internet using a mobile phone. Affordability of devices and lack of awareness are the main barriers to Internet use in the surveyed countries. Of those who do use the Internet in Mozambique, Tanzania, Uganda and Rwanda, 76%, 64%, 51% and 43%, respectively, cannot afford Internet-enabled devices. In Ghana and Nigeria, 43% and 40%, respectively, of Internet users do not know what the Internet is, while 22% of people in Nigeria and 14% in Mozambique and Ghana are digitally illiterate. In South Africa and Rwanda, 15% and 33%, respectively, of those who do not use the Internet stated that the cost of services is unaffordable. Evidence shows that the digital divide still persists in Africa with access and use of the Internet higher in more-developed economies, along with social differences in Internet use. There is evidence that this persistent digital divide follows historical social inequalities, thereby further widening the gap between the poor and the rich. Digital exclusion is primarily an issue of poverty, with those at the bottom of the pyramid (women and the poor) being the most marginalised.

Financial inclusion

Despite 71% of Africans in the surveyed countries not having access to formal financial services, especially those in rural areas (81%) versus 57% in urban areas, mobile money services are only successful in Kenya (85%), Ghana (55%) and Tanzania (45%), while very low in Nigeria (4%) and South Africa (8%). The poor performance of mobile money in countries such as Nigeria is mainly due to financial regulatory constraints which require mobile phone service providers to partner with banks, or require mobile money users to open accounts with formal banks in order to use mobile money services. In contrast, the poor uptake of mobile money services in South Africa is due to the majority of the population having access to formal bank accounts. Use of mobile money services is also uneven, with many mobile users not using mobile money in some of the larger markets like Nigeria and South Africa, but with some users across all countries accessing financial platforms, such as Internet banking and e-wallets. South Africa, where 56% of the population has a bank account, has the lowest percentage of mobile money service users. Despite their uneven uptake and use, mobile money services have had a positive impact on financial inclusion in Africa. About five out of ten (46%) people in the surveyed countries have access to financial services either through a mobile money platform or a banking account. Among the surveyed countries, 129 million people are financially included and, of these, 53 million use mobile banking platforms including mobile money and mobile banking services. Kenya is the leading country in financial inclusion, with nine tenths (87%) of the population having access to financial services, followed by South Africa and

Ghana (59% each). For the other countries surveyed, less than 50% of the population is financially included. Furthermore, people in Africa who live in urban areas (57%) are more likely to be financially included than those who live in rural areas (38%). Men are also more likely to be financially active than women, resulting in a 21% gender gap in the surveyed countries.

Internet and virtual work

Digital beneficiation is still low in Africa. Despite a number of initiatives to enhance digital opportunities in Africa, such as the creation of online jobs, e-commerce and digital financial instruments, few Africans participate actively in the digital economy. The survey shows that a small proportion of economically active individuals in Kenya, Ghana and Tanzania are online or microworkers, while these low percentages continue elsewhere with 3% in Nigeria and Uganda, and 2% percent in Senegal. Mozambique and South Africa have the largest percentage of microworkers among the economically active population, with 8% and 7%, respectively, but Mozambique's figure is calculated from a low online-user percentage of only 10%. The low numbers of microworkers in Africa are attributed to low Internet penetration in the region. Only three countries, Lesotho, Senegal and South Africa, have reached Internet penetration rates of 30%. Microwork is more common in Latin American countries where Internet penetration is much higher than in African and Asian countries. While Internet penetration seems to track GNI per capita, this is not the case with microwork. Colombia has the highest proportion of microworkers (13%), which is higher than Argentina's rate (5%) despite Argentina having a considerably higher GNI and Internet penetration rate of close to 100%. Microwork penetration in Guatemala and Peru, countries with a significantly lower GNI per capita, is low, with these countries having a similar proportion of microworkers (5%) to Argentina. In Rwanda, which has the lowest Internet penetration rate of less than 10%, (although not very different from Mozambique), less than 1% are microworkers.

Digital inequality

Paradoxically, as more people are connected to the Internet, with the increasing number of services and applications to enhance digital wellbeing, digital inequality is increasing rather than decreasing. This difference is not only between those online and offline, but also between those passively consuming what they are able to and those with the resources – financial and human – to put the technology to productive use, not only for their survival but for their prosperity. This is arguably the biggest challenge facing policy makers in an increasingly globalised economy over which they have limited control.

The fact that there is extensive coverage and yet a large percentage of the population remains unconnected suggests challenges with the current commercial model of exclusive spectrum licensing and universal service strategies.

To address this problem, complementary regulatory and delivery strategies will be required to enable different types of services to be offered by different kinds of operators.

- Spectrum policy should be reviewed to ensure more optimal coexistence of licensed and unlicensed spectrum that will optimise spectrum for diverse use, as well as prioritise affordable access to communications. Licensed spectrum required for the evolution of existing services needs to be assigned at a competitively-determined (efficient use) price to ensure the build out of capital-intensive networks benefits from economies of scale and devices.

- With evidence that even cost-based GSM prices are not affordable to most South Africans, spectrum should be made available for secondary use. Nationally allocated spectrum not in use in remote areas must be made available through low-cost or licence-exempt spectrum for communities, non-profit providers or micro-networks.
- Extending unlicensed spectrum to new frequency bands can spur investment and innovation, lead to the introduction of technologies that can complement licensed networks, (for example via the hand-off from GSM to public Wi-Fi, which now also has backhaul applications), and expand broadband access in low-cost, last-mile access.
- Enabling the deployment of dynamic spectrum is a critical aspect of spectrum management seeking to optimise the use of spectrum in the context of providing exclusive use required by operators for large sunk investments, as well as the expanded licence-exempt spectrum that can reduce digital inequality by enabling access, but also complementing high-cost, private use.

7.1 Arising research agenda

Alternative access and affordability strategies

Policy will need to address both supply-side and demand-side constraints on digital inclusion. While these are longstanding problems the traditional 'best practice solutions' have failed to address digital access.

Elimination of secondary taxes will remove a significant cost driver in the market. Even though data prices are relatively low by comparator countries, they are still much higher than lowest cost countries, and clearly unaffordable to the majority of Ugandans. Incentivised infrastructure sharing and wholesale regulation of facilities and bandwidth will reduce input costs for service providers and private networks, but this requires a fair, competitive environment in which all players can compete in this relatively small market. Political decisions requiring the use of state owned entities undermine the competitive strategies adopted in policy, and make the effective regulation of the sector required for Digital Uganda untenable. A new market review, and revision of competition regulations is required to provide all licensees and market players with a certain environment in which to operate. Universal service mechanisms should be reviewed in the context of the increasing availability of Internet-enabled devices and multiple points of public access. Leveraging of these trends to provide citizens with access to public connectivity is suggested (for example, providing free public Wi-Fi access in municipalities, schools, clinics) as a complementary service to enable digital inclusion. It is important to note that connectivity on its own will not reduce economic inequality.

While connectivity is a precondition for participation in a modern economy and society, it is not sufficient to end digital inequality.

Demand-side barriers are significant determinants of access and particularly with the increasing complexity of ICT services and use. This includes the development of skills to utilise services for passive consumption but, more particularly, for more productive use. Research is required into the best cross-sectoral approach that builds capacity not only for digital literacy, but also advanced skills to support optimal use of software and local content development to meet local needs, and in local languages. It will increasingly require skills and realignment of skills to deal with increased automation of work, artificial intelligence, big data analysis and robotics.

Changing forms of governance and regulation

The effective development of these alternatives requires research into the appropriate institutional arrangements to enable capacitated regulators to regulate an increasingly complex and adaptive globalised environment without state or industry capture, and without succumbing to pressures from state to enforce retrogressive taxes that undermine their digital futures, or be lobbied by operators who act anti-competitively, or place securing extractive rents above national public policy objectives.

A completely new approach to nationally exclusive licences and the enablement of default permissions for certain types of operators and service providers needs to be devised, not only community access providers as is the current focus of donors concerned with affordable access. It will require a shift from static regulation to models of dynamic efficiency, and a better understanding of the complementary nature of OTT services, for example, to traditional players (see zero rating paper).

New data and indicators for digital economy

This will also require the gathering of new data and indicators across the digital economy about what exists, and in what form, how much it costs, its price at the point-of-sale, and what gaps exist in the reach of services from an economic, social and cultural perspective. An integrated and coordinated data-gathering procedure for the sector, and ICT across sectors, is required, which clearly allocates responsibilities for the collection of data, and makes this publicly available on a national indicator data portal, with the underlying dataset available according to open data access principles.

In order to fulfil this precondition, there is a need for the policy and regulatory entities in Africa to standardise the process and frequency of collecting data; to stipulate what data needs to be publicly available and what information from the public and private sectors should remain confidential; and to define the format in which data needs to be presented.

This is something that could logically be integrated into global Open Government Data initiatives.

Data governance and open data

The legislation necessary to build a trust-based environment for e-commerce, e-government, digital finance and personal use appropriate to the African context, while aligning with fundamental rights based international treaties and conventions must be drafted, the necessary public consultations concluded, and arguably the greatest challenges of all, implemented. This process requires the introduction of legislation and guidelines in the areas of cybersecurity, privacy, protection of data and access to information.

This needs to be framed in the context of an open data policy that safeguards these rights and which will enable the free flow of information required for more effective planning by governments and service delivery entities, increase the uptake of online rather than face-to-face transactions, and create opportunities for entrepreneurialism and innovation. The factors inhibiting the adoption and certainly implementation of such public interested policy agenda requires investigation.

Africa's inclusion in the gig economy

African economies need to formulate policies with the aim of removing barriers that prevent full engagement in the digital economy and optimising the benefit. The policies must target the enhanced participation of Africans in e-commerce and microwork to boost Africa's long-term competitiveness. Critical to achieving this objective is that policymakers should look beyond supply-side and infrastructural issues, although pervasive infrastructure is a precondition for digital inclusion. This will require greater state coordination across sectors, and between the public and private sectors, to ensure that policies and the implementation thereof will align skills and improve the readiness of citizens, the state and companies for digital technology mobilisation.

The actual interventions required to support the flow of data and cross-border services in Africa, and reduction of e-trade frictions that will underpin the African Free Trade Agreement, need to be investigated and formulated into policy principles and practices that enable the required regulatory and market harmonisation.

Africa needs to develop initiatives towards attaining harmonised regional strategies to make smaller markets more attractive for investment and which take into account generation, storage, processing and transfer of data locally and across boundaries, e-government, taxation in the digital economy, and inclusive access and use. The policy should take into consideration and reflect the changes occurring in the production process and the increasing digitisation of production and consumption processes, and international trade. Enabling cross-border trade and reciprocal financial and taxation regimes will be critical to realising Africa's digital future.

African countries need to adjust their competition and taxation policies to accommodate the development of digital markets and cross-border trade to guard against oligopolies and monopolies, with a clear focus to protect consumer and citizen interests, as well as local online businesses. This will help to ensure that the benefits of the digital economy do not only accrue to global platforms and the countries in which they are located.

Tax

A review of taxes on the sector is urgently required. Regressive taxes on devices and services that drive up the cost of communication and inhibit Internet penetration could be shifted to a far more progressive tax regime through corporate taxation. Excessive increases are of course also counterproductive and create disincentives for investment, but the reduction of direct and indirect taxes from fees will isolate one of the main cost drivers, reducing the cost of communication which has been shown in some instances (Namibia, for example) to result in increased use, driving economies of scale, making companies more profitable and increasing taxes derived from profits. This is a far more productive and fair form of taxation which is known to be a key income stream required by governments for delivery of essential government services.

With increased global governance of public goods such as the Internet, the best way to secure legitimate taxes is through global cooperation, such as the tax proposed on global platforms by the G20. What is required is a thorough examination of how retrogressive irrational taxes such as social media and blogging taxes can be removed and their revenues offset with legitimate taxation of platform services and activities occurring at the national level, and a demonstration of the benefits of African governments' participation in a system of global governance in order to safeguard public goods at the national level.

Annex I: Budget summary

Summary of expenditures

Budget category	Expenses (USD)
Personnel	4 223
Consultants	0
Evaluation	0
Equipment	0
Travel	0
Training	0
Research Expenses	51 388
Indirect Costs	7 228
Total	**62 839**

Personnel and research expenses

Budget item	Expenses (USD)
Project leader/data analysis	4 223
Senior Researcher/Quality control	941
Comparative reports and policy briefs 3 countries	10 176
Car rental plus Fuel -	0
Per Diems	2 400
Local Project Leader fees for survey management	708
Survey methodology, training, sampling, weighting, data cleaning	2 150
Travel	2 000
Per Diems	200
Digital Equipment	195
Global communication	30 986
Regional communication	1 632
Total	**55 611**

Annex II: Conference /workshop matrix

Selected conferences, workshops and training					
Staff member	**Name of conference/ workshop**	**Venue and host/sponsor/funder**	**Paper title/Theme of conference or panel**	**Outcomes**	**Date**
Anri van der Spuy	FIFAfrica-CIPESA	Johannesburg	Internet freedom forum	Presented on gender in ICTs	September 2017
Anri van der Spuy	GCSCC Annual Conference, 6 Feb 2018	Oxford University, Oxford Martin School	Annual meeting	Meetings with stakeholders and (eventually) selection as regional centre for Oxford cybersecurity capacity awareness model	February 2018
Anri van der Spuy	RightsCon	Toronto, Canada (As representative for UNESCO and Research ICT Africa)	Session on multistakeholder governance; session on gender and ICTs; session on hate speech	IDRC meetings, meetings with regional partners, networking with potential future partners (Mozilla etc.)	May 2018
Anri van der Spuy	WSIS Forum	Geneva, Switzerland	Two sessions for RIA/ADPP		March 2018

Anri van der Spuy	Internet shutdowns in Africa workshop	Johannesburg	2-day workshop on Internet Shutdowns	Commitment to study/together understand shutdowns in broader African context of content restrictions	June 2018
Anri van der Spuy	CPRsouth 2018	Maputo Mozambique	Cyber policy: Scanning the horizon from the Global South	Presentation on Promoting cyber security through stronger collaboration in Africa	September 2018
Broc Rademan	Electronic Amendments Bill workshop	Pretoria, SA. DTPS, RIA	RIA's Amendment submissions	Presented RIA's submissions to the proposed Electronic Communications Amendment Bill provisions made by the DTPS.	September 2017
Broc Rademan	ICASA 5G Forum	Johannesburg	ICASA - 5GMobile Networks	Member of policy and regulation Working Group	September 2017
Broc Rademan	North Africa Internet Governance Forum	Sharm el Sheik, Egypt. APC, RIA	Annual forum meeting	Observed Forum discussions of regional IG issues.	December 2017
Broc Rademan	African Internet Governance Forum	Sharm el Sheik, Egypt. APC, RIA	Annual forum meeting	Participated in Forum's discussions on continental IG issues including cybersecurity.	December 2017
Chenai Chair	Spain Internet Freedom Festival	Valencia, Spain and IREX	Presented on digital rights from an end user's perspective		March 2017

Chenai Chair	Nigeria Internet Freedom Forum	Lagos, Nigeria Paradigm Initiative	Presented on the state of internet freedom in South Africa	Contributed to their internet freedom report	April 2017
Chenai Chair and Alison Gillwald	Africa Internet Summit	Nairobi, Kenya AFRINIC/Research ICT Africa	Presented on Internet measurements: Affordability challenges (Chair) Gillwald		June 2017
Chenai Chair	Annenberg Media Policy training 2017	Oxford, and Annenberg school of communications/ Research ICT Africa	Presented research on social media perception in Africa	Invitation for RIA to be a research partner for the annenberg research school	July 2017
Chenai Chair	Facebook Safety open house	Capetown, South Africa and Facebook	Pesentation on Online Safety: locating end users perspectives on online safety in Africa	Connected with the centre for justice and crime prevention on children's safety	September 2017
Chenai Chair	Gender expert workshop	Malaysia, IDRC and APC	gender research workshop	Joined the feminist research network	September 2017
Chenai Chair	ICANN 60	Abu dhabi and ICANN	ICANN fellow		November 2017
Chenai Chair	African Internet Governance Forum	Sharm el Sheik, Egypt. APC, RIA	Annual forum meeting	Participated in Digital Economy panel	December 2017

Chenai Chair and Anri van der Spuy (RIA) and Moses Owiny Women of Uganda Network)	Rightscon	Toronto IDRC/RIA	Just another effort to close the digital Gender Gap? Tackling gender digital divides in Africa with gender-responsive policies and measures informed by evidence	Blog published on APC site by Moses Owiny- https://www.apc.org/en/blog/rightscon-2018-interrogating-gender-digital-divides-invisible-unconnected-women-global-south	May 2018
Chenai Chair	38th Human Rights Council	Geneva, United Nations	Advancing women's rights in the economic sphere through (ICTs)	Shared Research ICT Africa's After Acces work with with Human Rights Council. https://medium.com/@UNHumanRights/bridging-the-digital-gender-divide-4b3971b56987	July 2018
Chenai Chair	Wikimania 2018/Decolonising the internet	Cape Town, Whose Knowledge	Participant in discussion on decolonising knowledge creation		August 2018
Chenai Chair	CPRsouth 2018	Maputo Mozambique	Gender at the intersection of other divides	Can the Internet be the disruptor needed to deal with the intractable problems faced by African youth?- Presentation	September 2018

Enrico Calandro	UPENN/CIPESA training workshop on Internet Policy Research	Uganda, funded by UPENN	Measuring Internet Development in Africa from a content use, hosting and distribution perspective	20+ Internet policy researchers trained on internet measurement research	March 2018
Enrico Calandro	Africa Internet Summit	AfriNIC, Senegal	An Investigation into factors affecting Internet Performance in Africa: a throughput, latency, a and content hosting perspective	An opportunity to discuss RIA's work on internet measurements with African ISPs, AfriNIC and other Af* organisations.	May 2018
Enrico Calandro	Workshop for AU Member States on Cyber-Strategy, Cyber-Legislation and Setting up CERTs.	AU Addis Ababa, Ethiopia	Collaboration models for the protection of the Internet Infrastructure	Engagement with the AU on cybersecurity research and capacity building activities	March 2018
Enrico Calandro	Oxford Global Cyber Security Capacity Centre Annual Meeting	Oxford, GCSCC	Participant	GCSCC expressed an interest in partnering with RIA/ADPP for the establishment of a regional centre on cybercapacity research	June 2018
Enrico Calandro	Mozilla Fellowship Offboarding	Ford Foundation, NYC	Participant as a hosting organisation	Extension of the tech policy grant through the Ford Foundation Tech Exchange Programme	June 2018

Enrico Calandro	ITS Zambia	ITS/University of Zambia	Internet Development in Africa: a content use, hosting and distribution perspective	Enrico Calandro invited to lead a Telecommunications Policy special issue on the global South	March 2018
Enrico Calandro	CPRsouth 2018	Maputo Mozambique	Barriers to broadband. What can be done? Panel	Enrico presented on "The impact of remote hosting on Internet performance"	September 2018
Onkokame Mothobi	CSAE 2017 Conference on Economic Development in Africa	Oxford	Infrastructure Deficiencies and Adoption of Mobile Money	An opportunity to engage with academics in the telecommunication field who showed an interest in RIA research	April 2017
Onkokame Mothobi	CCRED 2017 3rd Annual Competition & Economic Regulation (ACER) Conference	Dar es Salam, Tanzania	The Impact of Regulatory Policies on Mobile Retail Prices in Sub-Saharan Africa	An opportunity to present some of RIA's work on conference and exhibit its importance on issues relating to competition and regulatory interventions. Excellent workshop to engage with policy makers and regulators.	June 2018
Onkokame Mothobi	ITU EGTI/EGH Expect Meeting	Geveva, Switzerland	The state of ICT in Lesotho, Participated in the Pricing basket discussion	An excellent platform which gave RIA an opportunity to be recognized on development of ICT indicators	July 2017

Onkokame Mothobi	CPRsouth Young Scholars Program	Yangon, Myanamar	Training workshop	Attended a training workshop on ICT	September 2017
Onkokame Mothobi	ITS Zambia	Lusaka, Zambia	The adoption of microwork in Sub-Saharan Africa	Paper presentation	March 2018
Onkokame Mothobi	CPRsouth 2018	Maputo Mozambique	Are ICTs contributing to financial inclusion?	Presentation on Mobile Money and financial inclusion in Sub-Saharan countries	September 2018
Onkokame Mothobi	South Africa Data Inquiry Competition Commission	Johannesburg, South Africa	Data Service Market Inquiry	Presentation on Pricing in South Africa and After Access findings	October 2018
Alison Gillwald	African Conference on Information Technology and Systems	University of Cape Town, Cape Town	From digital divide to digital inequality-shifting the ICT4D discourse	Keynote speaker assessing the shift in ICT4D highlighting the challenges and the way forward	July 2017

Alison Gillwald	Digital BRICS Summit, organised by the Observer Research Foundation in collaboration with the Ministry of External Affairs, Government of India	New Delhi	Selected as only external resource person from SA to engage in a closed discussion to set up DIGITAL BRIC harmonisation project	Opportunity to engage with influential organisations and individuals in India on digital research partnerships	August 2017
Alison Gillwald	WSIS 2017	Geneva	Selected as one of only three inputs from academic community for high level inputs	Recognition by ITU and Partnership on measuring the Information Society on RIA contribution to indicators, exposure to donors and partners. Approaches for WEF Internet4All data collaboration.	September 2017
Alison Gillwald	Artificial Intelligence and Inclusion	Rio de Janeiro	Network of Centres (NOC) meeting hosted by Harvard Berkman Klein Centre and Brazilian Internet and Soceity Centre.	Excellent opportunity to engage critically with dominant epistemic communities on AI such as BKC and WEF with do not contextualise their global research in developing countries context.	September 2017

Alison Gillwald	WTDC 2017	Buenos Aires	Invitation to join Canadian delegation as telcom and gender expert	High level exposure with Canadian delegation, Global Affairs, IDRC and Canadian Ambassador. Invitation to participate in various high-level and side events. Meetings with APC, infosoc on community access networks.	September 2017
Alison Gillwald	Law and Development Research Conference	Antwerp	FROM DIGITAL DIVIDE TO DIGITAL INEQUALITY: The connectivity paradox	Presentation of research paper highlighting digital inequality	September 2017
Alison Gillwald	Mobile World Congress	Barcelona	Connected women engagement	Connected with policy makers and shared Afters Access findings	Feb 2018
Alison Gillwald	WSIS Forum	Geneva, Switzerland	How can technology be a force for good in Africa?- Securing digital future for all African	Panel moderation with participants from UNCTA, UNHCR and APC	March 2018
Alison Gillwald	University of Cape Town-Nelson Mandela School of Governance	Cape Town	Public lecture: Understanding the paradox of digital inequality as more Africans come on line	Presentation on After Access data at the University of Cape Town with Carlos Lopes as Discussant	May 2018

Alison Gillwald	CPRsouth 2018	Maputo Mozambique	Gender at the intersection of other divides	Moderation of the gender and the intersection divides	September 2018
Alison Gillwald	ITU Telecom World	Durban, South Africa	Digital Ineqaulity workshop with APC and CRASA	Presentation on Dital inequality in South Africa	September 2018
Alison Gillwald	ITU Telecom World	Durban, South Africa	Digital Economy session hosted by MTN	Leveraging OTTs to grow digital markets in Africa	September 2018
Alison Gillwald	ITU Regional Regulatory and Economic Dialogue (RED) for Africa	Ouagadougou, Burkina Faso	Policy, regulatory and economic approaches for digital eco-system-towards SDGs	**Key note paper:** ICT digital trends, economic impact and applications the Africa region	October 2018
Alison Gillwald	ITU Regional Regulatory and Economic Dialogue (RED) for Africa	Ouagadougou, Burkina Faso	Strategies to translate international Internet connectivity (IIC) into better and more affordable national access to ICTs in developing countries, in particular in Africa	Presentation on Affordable Access	October 2018